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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/630,950	07/30/2003	Clifford E. Lucas	06401 USA	1784

23543 7590 06/01/2005

AIR PRODUCTS AND CHEMICALS, INC.
PATENT DEPARTMENT
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EXAMINER

LEUNG, RICHARD L

ART UNIT	PAPER NUMBER
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3744

DATE MAILED: 06/01/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/630,950

Applicant(s)

LUCAS ET AL.

Examiner

Richard L. Leung

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 February 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 2,3,5-7,9-12,14,15,17-19 and 21-28 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 28 is/are allowed.
- 6) ☒ Claim(s) 2,3,5,6,9-12,14,15,17,18 and 21-24 is/are rejected.
- 7) ☒ Claim(s) 7,19 and 25-27 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>1-24-05</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Objections

1. Claims 25-27 are objected to because of the following informalities: the recitations of "lower that" in the last lines of claims 25 and 26 are understood to be -- lower than--. Appropriate correction is required.

Claim Rejections - 35 USC § 103

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

3. Claims 2, 3, 5, 6, 9-12, 14, 15, 17, 18, and 21-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 5689141 (Kikkawa et al.) in view of "Design, simulation create low surge, low cost gas-injection compressor" (Zeckendorf et al.). Kikkawa et al. disclose a system and method for liquefying natural gas, which is considered equivalent to a baseload LNG plant as defined in paragraph [0003] of the present specification, comprising the use of refrigerant gas compressors 1-3, each having a gas inlet and a gas outlet and being driven by single-shaft gas turbines 4 and 6 that have a maximum power. Specifically, single-stage compressor 1 is driven by gas turbine 4 and compressors 2 and 3 that create a multi-stage compressor system is driven by gas turbine 6. See particularly column 5, lines 59-67 and Fig. 1. Kikkawa et al. further disclose the use of vessels (denoted schematically) in fluid communication with the inlet conduits of the compressors 1-3 (see Fig. 2). Kikkawa et al. fail to disclose the use of a recycle pressure relief device in fluid communication with the gas outlet of the compressors, the recycle pressure relief device adapted to receive a stream of a

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compressed gas having a discharge pressure from the gas outlet and a conduit in fluid communication with the gas inlet, whereby the gas inlet receives at least a portion of the stream of the compressed gas transmitted to the conduit from the recycle pressure relief device when the discharge pressure reaches a designated pressure, and further fail to disclose at least one additional recycle pressure relief device in fluid communication with the gas outlet, the additional recycle pressure relief device adapted to receive an additional stream of the compressed gas from the outlet. Referring particularly to Fig. 3c, Zeckendorf et al. teach a system and method to prevent surging in a gas compression system comprising a compression system, which may be driven by a gas turbine (see page 57, paragraph 7), wherein each compressor is provided with two recycle pressure relief valves (designated as "recycle" and "hot anti-surge") in communication with the outlet of each compressor that are each adapted to receive a stream of compressed gas having a discharge pressure from the compressors whereby at least a portion of the gas from the compressor outlet is recycled back to the compressor inlet through a conduit from the pressure relief valves when the discharge pressures reach a designated value (i.e. surge conditions). See also discussion of "Configuration C" in column 4 of page 59. Zeckendorf et al. also teach the inclusion of a vessel (knockout drum) in fluid communication with the gas inlet of each compressor such that at least a portion of the stream of the compressed gas in the inlet conduit is transmitted to the vessel. Accordingly, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have provided each refrigerant gas compressor 1-3 in the system disclosed by Kikkawa et al. with the recycle pressure

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relief device arrangement (i.e. recycle and anti-surge pathways) because Zeckendorf et al. explicitly teach that this configuration effectively prevents surging in the system.

Allowable Subject Matter

4. Claim 28 is allowed.
5. Claims 7 and 19 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

6. Applicant's arguments, filed 25 February 2005, with respect to the rejection(s) of claim(s) 2, 3, 5, 6, 9-12, 14, 15, 17, and 21-24 under 35 U.S.C. 103(a) have been fully considered and are persuasive. Therefore, this Office Action is being made non-final to afford the Applicant an opportunity to respond to the new ground(s) of rejection.

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure


US 5195875 (Gaston): discloses an anti-surge configuration for a compressor system comprising a pathway from the compressor outlet to the compressor inlet.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Richard L. Leung whose telephone number is 571-272-4811. The examiner can normally be reached on Mon-Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cheryl J. Tyler can be reached on 571-272-4834. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Richard L. Leung **CHERYL TYLER**
Examiner **SUPERVISORY PATENT EXAMINER**
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